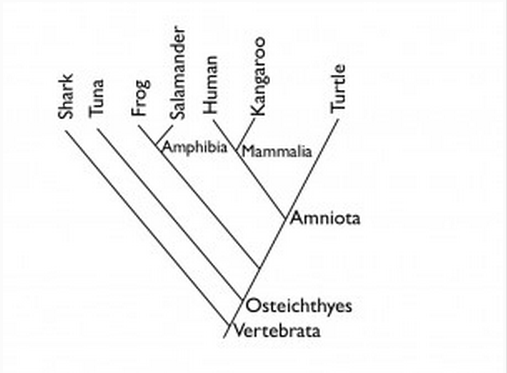
**SBI3U: Evolution Unit Review**

1. Identify the major contributions to the theory of Evolution of each scientist below:
   1. Lyell
   2. Cuvier
   3. Lamarck
   4. de Buffon
2. List the conditions that are required for a fossil to form. Describe the stages in fossil formation, as well as draw a sketch of the layers of the earth’s sediment illustrating where you are likely to find simple and complex fossils.
3. Fossils can be described as direct evidence for evolution. Describe this statement using information from our fossil lab and the terms “punctuated equilibrium” and “gradualism”.
4. Lamarck believed that living species evolved over time. Compare and contrast this theory with Darwin’s theory of natural selection.
5. What did Darwin observe when he landed in the Galapagos islands in the 1800s? How did this provide evidence for his theory of evolution?
6. Brainstorm examples for the following pieces of evidence for evolution:
   1. Contrivance
   2. Vestige
   3. Adaptation
   4. Atavism
   5. Homologous structure
   6. Analogous structure
7. Define evolution in terms of gene frequencies.
8. What are the conditions that must be met in order to maintain Hardy-Weinberg Equilibrium?
9. Explain, using an example for each, how reproductive isolation of two different populations can occur as a result of:
   1. Mechanical isolation
   2. Behavioural isolation
   3. Gametic isolation
   4. Temporal isolation
   5. Habitat isolation
10. Rearrange these events from most ancient to most recent:
    1. First eukaryotic organism
    2. First land plant
    3. Homosapiens evolve
    4. Largest mass extinction event
    5. First prokaryotic cell
11. Examine the following phylogenetic tree:



1. Which two species are most closely related? Explain why.
2. List all the species to which the Tuna is most closely related.
3. Is the tuna more closely related to the turtle or the shark? Explain your reasoning.
4. Explain how each of the following provides evidence for evolution:
   1. The fossil record of whales
   2. Homologous anatomy of mammalian limbs
   3. Nonfunctioning rudimentary eyes of cave dwelling fish
5. In parts of Africa, the incidence of sickle cell anemia (a recessive disease) is around 1 in 64. Estimate the genotype frequencies of this population.
6. Use the table below to answer the following questions:

|  |  |  |  |
| --- | --- | --- | --- |
| **Population** | **AA** | **Aa** | **aa** |
| X | 25 | 50 | 25 |
| Y | 40 | 20 | 40 |
| Z | 2 | 16 | 32 |

1. For each population, determine the expected genotype frequencies
2. Which population is not in Hardy-Weinberg equilibrium? Explain whether this population is being influenced by a selective pressure. Identify that pressure and draw a graph illustrating it.
3. Draw a graph and explain the type of selection pressure that would lead to the following scenarios:
   1. Hollow bones in flightless birds
   2. the diversity of Darwin’s finches
4. What correlation would you expect to find between the genetic diversity of human populations and the length of time they have been in a particular geographical location? How does the founder effect account for this correlation?
5. What is a genetic bottleneck and what does it do to the diversity of the species?
6. Explain disruptive selection and draw a graph to illustrate the concept. What does disruptive selection lead to?
7. What is the difference between allopatric and sympatric speciation?
8. How does convergent evolution differ from coevolution?

*This is just an overview of all of the concepts covered in class. All homework, labs, activities are fair game.*

**Extra textbook practice: p. 382# 1-3, 5, 7-14, 20-24, 32, 34-36, 42, 44-48, 65, 66, 69, 70, 74, 77, 78, 96, 111**